1. The effect of mechanical stress on the capacitance-voltage characteristics of GaAs MOS diodes

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III–V compound semiconductor such as GaAs has piezoelectric properties. The effect of the mechanical stress on the capacitance-voltage characteristics of the MOS diodes appears as the change in capacitance at the constant gate bias voltage. The theory for the change in capacitance derived by M. Kusaka et al. is applied to the Al–Al_2O_3–p–GaAs MOS diode. By comparing the peak height of the theoretical ΔC–V_g curve with the experimental one, the surface state density is determined to be $2–3 \times 10^{11}$ $cm^{-2}eV^{-1}$. For further development the new preparation of MOS diodes is also pursued experimentally.

2. CaSe：Ce^{3+} 螢光体の発光特性

小川嘉彦

CaSe：Ce^{3+} 螢光体の発光スペクトルと励起スペクトルを 300K，80K，6Kで測定した。Ce^{3+} イオンのイオン内遷移に起因する発光帯 $^2T_{2g}(5d) \rightarrow {}^2F_{7/2}$，$^2F_{5/2}(4f)$，および励起帯 $^2F_{5/2}(4f) \rightarrow {}^2T_{2g}(5d)$ を観測した。それらのバンドのフォノン構造を解析し，$4f$軌道に対する結晶場定数 $V_4^{(f)}$，$V_6^{(f)}$ の値と，スピン－軌道相互作用定数 ζ_f の値を決定した。